CDT introduces the MX1000SX - (Ultra-flexible) 3-way compact Mid-woofer E.Q. crossover

Finally, we have created a second compact economical solution to the installation of a front-mounted 3-way system for the general market. This incredibly flexible module will also act as a 2-way crossover. This unit is specifically oriented to the use of very small 2~3 inch midrange drivers in a three way system.

This crossover module offers interactive crossover to and adjustability of the mid-range and tweeter and a switchable conventional second order or high-tech elliptic filter to cross over the tweeter.

New and unprecedented functionality in this unit is highlighted by this dual-order, tweeter crossover.

Designed to produce a crossover to the midrange around 1500 Hz with virtually any woofer and a two or three-inch midrange in a typical installation this crossover produces amazing results with maximum flexibility and compactness in a very tight installation.

The woofer's proprietary tapped inductor selects three different values to provide three different crossover frequencies for a range of woofers or mid-woofers.

The midrange level is adjustable to six different levels to blend optimally or in case you want to crossover to the tweeter directly using a mid-woofer the midrange function can be set to the lowest level and ignored. The tweeter also has a tapped inductor to control this crossover also.

This most flexible approach will produce the best sound in most installations and will implement almost any installation.

Choose the mounting position and select the drivers to accommodate your vehicle and to facilitate a natural sound. A very small, extended midrange speaker can be selected to augment the tweeter response especially if a high mounting position is chosen for the tweeter.

The midrange is allowed to crossover to the tweeter based on the midrange's natural character.

The MX1000SX has five multi-position switches. Referring to the unit with the connector row down the HDR-1 switch is seen to the left on the component board under the cover. The chart page below shows the effect of the settings of this switch from LO to HI. This controls the woofer crossover as shown.

The next switch is labeled HDR-2 and is in the upper left corner of the board. It has six positions which control the midrange level as shown. The far left switch position is the bottom curve – maximum attenuation.

The next switch is labeled HDR-3 in the upper right corner and it controls the tweeter level. This level is modified by the order switch 2^{ND} or 5^{th} in the right hand side of the approximate center of the board and by the TW EQ switch on the lower right. The TW EQ switch changes the value of an inductor which alters the response shape as shown in the graphs.

The small midrange drivers used in this system require minimal enclosure volume and can be located in the most densely occupied locations.

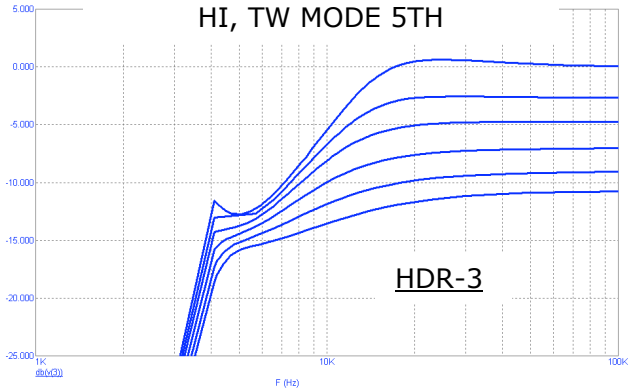
Installation of this unit is an adventure in a world of possibilities and custom control.

The following charts show what you can do with this device and these functions can be used singly or combined.

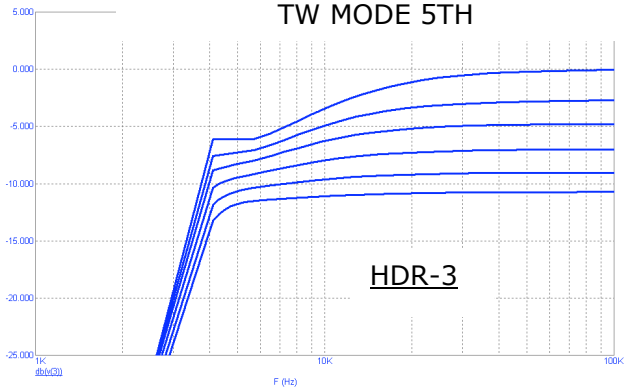
The EQ can be low for a flatter frequency response or high for a flatter power response. This depends on where the tweeters are mounted. EQ set to high accommodates indirectly aimed mountings.

It is possible to use the crossover without some drivers connected. Always set the HDR switch for the unused driver(s) to LO (or all the way to the left for HDR-2) in that case. Omitting the woofer will place an extra 4 Ohm load on the amp over a narrow frequency band around 1kHz. Omitting the woofer is the least desirable omission of the three possible. A small extra load will be placed on the amp over a limited frequency range in the other cases.

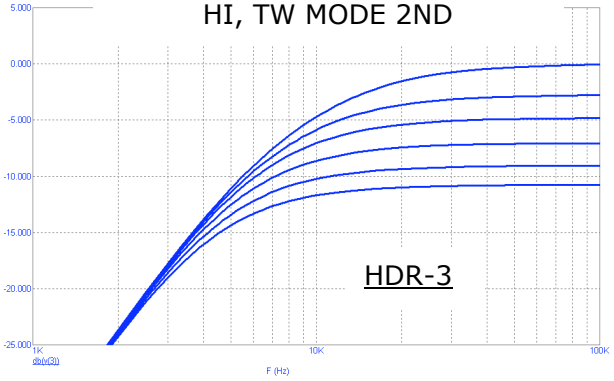
Tweeter level settings – TW EQ HI, TW MODE 5TH



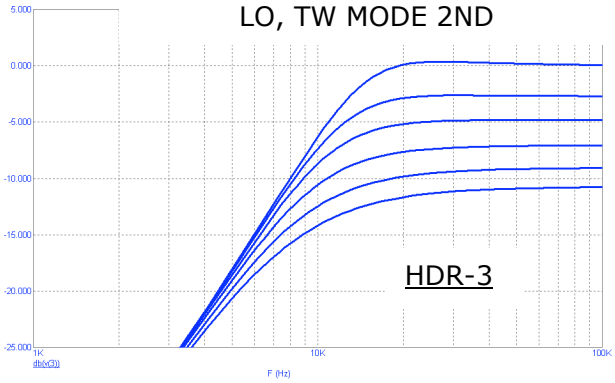
Tweeter level settings – TW EQ LO, TW MODE 5TH



Tweeter level settings – TW EQ HI, TW MODE 2ND

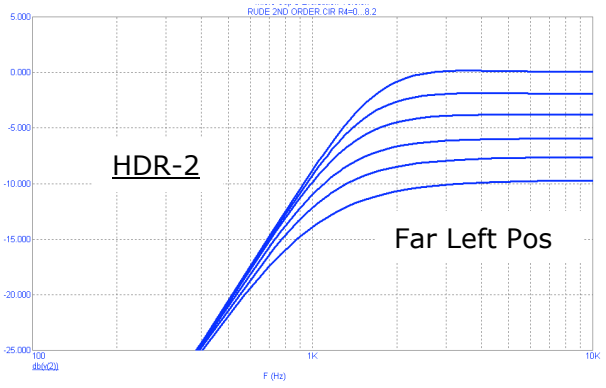


Tweeter level settings – TW EQ LO, TW MODE 2ND

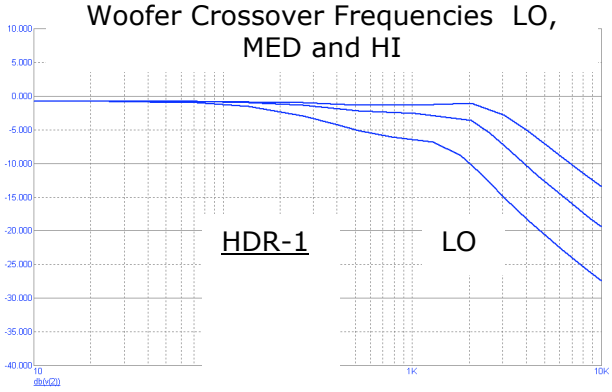


HI

Midrange Level Settings



Woofer Crossover Frequencies LO, MED and HI



Notes

Operation of the MX1000SX

The levels of the midrange and tweeter can be adjusted by attenuation over approximately a 10db range. The midrange crossover is approximately 1kHz high pass and the low pass is left to the driver's natural roll-off in whatever is the particular mounting position – it runs all the way up. The tweeter crossover can be set to approximately 4kHz for two-way operation or 8kHz for three-way use with small midrange drivers generally 2~3inch size but 4 inches is also useable. Various contours between these two frequencies and some very gradual blends are also available. Tweeters require some EQ in almost all cases so the actual acoustic crossover can occur lower in frequency than the crossover setting. This is especially true for gradual slopes.

Summarizing from the graphical curves the following amplitudes and frequencies can be estimated. The woofer and midrange settings are relatively straightforward. The tweeter gains can be modulated or shaped by different settings of the MODE and EQ jumpers.

HDR-1: WFR X FREQ
LO: 500Hz first order to 2kHz and second order above 2kHz
MED: 2kHz second order
HI: 3.5kHz second order

HDR-2: MID LEVEL
HI: (position1 – far left)) – crosses over at 1.5kHz second order with 0dB attenuation above 4kHz
Position 2 – crosses over at 1.3kHz second order with 2dB attenuation above 4kHz
Position 3 – crosses over at 1.25kHz second order with 4dB attenuation above 4kHz
Position 4 – crosses over at 1.2kHz second order with 6dB attenuation above 4kHz
Position 5 – crosses over at 1.1kHz second order with 8dB attenuation above 4kHz
Position 6 – crosses over at 1.0kHz second order with 10dB attenuation above 4kHz

HDR-3: TW LEVEL (TW MODE –2nd, TW EQ-HI)
The crossover slope and driver characteristics will result in a lower acoustic crossover frequency than the numbers below – typically 0.7 times lower.
HI: (position1) – crosses over at 12kHz second order with 0dB attenuation ref. 20kHz
Position 2 – crosses over at 11kHz second order with 2dB attenuation ref. 20kHz
Position 3 – crosses over at 10kHz second order with 4dB attenuation ref. 20kHz
Position 4 – crosses over at 10kHz second order with 6dB attenuation ref. 20kHz
Position 5 – crosses over at 10kHz second order with 8dB attenuation ref. 20kHz
Position 6 – crosses over at 10kHz second order with 10dB attenuation ref.20kHz

HDR-3: TW LEVEL (TW MODE –5th, TW EQ-HI)
This setting gives a combination crossover that is 5th order below 4kHz and varies as listed for each attenuation setting. The crossover will acoustically occur between the 5th order frequency and the –3dB frequency.
HI: (position1) – crosses over at 4kHz 5th order and 12kHz 1st order, 0dB attenuation ref. 20kHz
Position 2 – crosses over at 4kHz 5th order and 11kHz 1st order, 3dB attenuation ref. 20kHz
Position 3 – crosses over at 4kHz 5th order and 10kHz 1st order, 5dB attenuation ref. 20kHz
Position 4 – crosses over at 4kHz 5th order and 9kHz 1st order, 7.5dB attenuation ref. 20kHz
Position 5 – crosses over at 4kHz 5th order and 7kHz 1st order, 10dB attenuation ref. 20kHz
Position 6 – crosses over at 4kHz 5th order and 7kHz 1st order, 12dB attenuation ref. 20kHz

HDR-3: TW LEVEL (TW MODE –2nd, TW EQ-LO)
The crossover slope and driver characteristics will result in a lower acoustic crossover frequency than the numbers below – typically 0.7 times lower.
HI: (position1) – crosses over at 10kHz second order with 2dB attenuation ref. 20kHz

Position 2 – crosses over at 8kHz second order with 3.5dB attenuation ref. 20kHz
Position 3 – crosses over at 7 kHz second order with 5.5dB attenuation ref. 20kHz
Position 4 – crosses over at 6.5kHz second order with 7.5dB attenuation ref. 20kHz
Position 5 – crosses over at 6kHz second order with 9.5dB attenuation ref. 20kHz
Position 6 – crosses over at 5.5kHz second order with 11dB attenuation ref.20kHz

HDR-3: TW LEVEL (TW MODE –5^{th}, TW EQ-LO)
This setting gives a combination crossover that is basically 5^{th} order below 4kHz and varies as listed for each attenuation setting. The crossover will acoustically occur close to the 4kHz frequency except the higher gains offer some EQ that could raise the crossover slightly to perhaps 5~6kHz in the two highest gains. This is the typical two-way elliptic crossover.
HI: (position1) – crosses over at 4kHz 5th order and 6kHz 1^{st} order, 1.5dB attenuation ref. 20kHz
Position 2 – crosses over at 4kHz 5th order and 5kHz 1^{st} order, 3dB attenuation ref. 20kHz
Position 3 – crosses over at 4kHz 5th order, 5dB attenuation ref. 20kHz
Position 4 – crosses over at 4kHz 5th order, 7.5dB attenuation ref. 20kHz
Position 5 – crosses over at 4kHz 5th order, 9dB attenuation ref. 20kHz
Position 6 – crosses over at 4kHz 5th order, 11dB attenuation ref. 20kHz